

FIG. 2

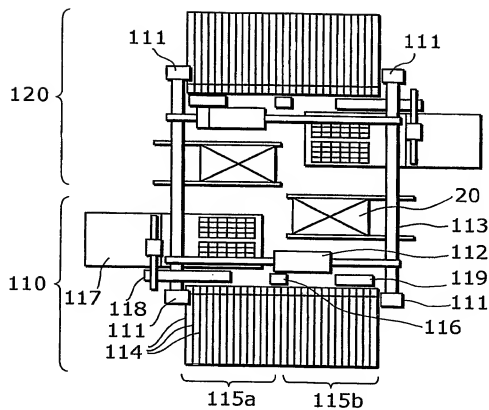


FIG. 3

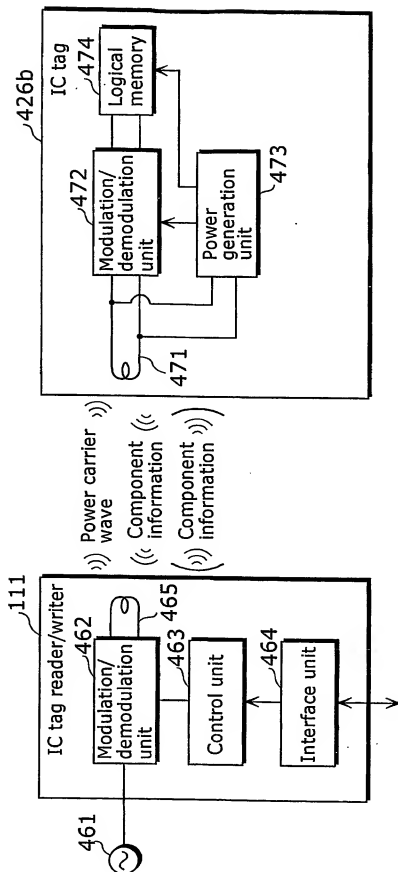
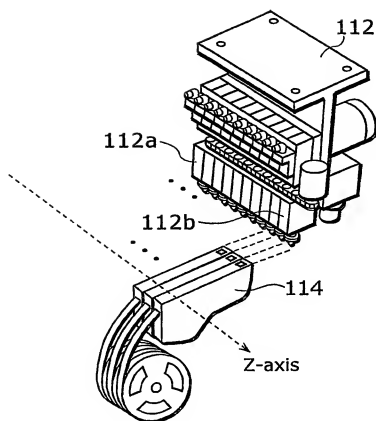
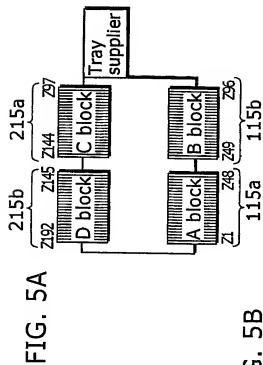


FIG. 4



**FIG. 5B**

	A				B				C				D				
	Z1	Z48	Z49	Z96	Z97	Z144	Z145	Z192									
Component cassettes	Tape width																
	8(Double)	O	O	O	O	O	O	O	O								
	8(Single)	O	O	O	O	O	O	O	O								
	12	O	O	O	O	O	O	O	O								
	16	O	O	O	O	O	O	O	O								
	24	O	O	O	O	O	O	O	O								
	32	O	O	O	O	O	O	O	O								
	44	O	O	O	O	O	O	O	O								
	56	O	O	O	O	O	O	O	O								
72	O	O	O	O	O	O	O	O									
	Z1	Z45	Z47	No. of tapes	Z97	Z99	Z141	Z143	No. of tapes	Z145	Z147	Z189	Z191	No. of tapes	No. of Z positions	Occupied consecutive positions	
	O	O	O	48	O	O	O	O	48	O	O	O	O	O	48	192	1
	O	O	O	24	O	O	O	O	24	O	O	O	O	O	24	96	1
	O	O	O	24	O	O	O	O	24	O	O	O	O	O	24	96	1
	O	O	O	12	O	O	O	O	12	O	O	O	O	O	12	48	2
	O	O	O	12	O	O	O	O	12	O	O	O	O	O	12	48	2
	O	O	O	12	O	O	O	O	12	O	O	O	O	O	12	48	2
	O	O	O	8	O	O	O	O	8	O	O	O	O	O	8	32	3
	O	O	O	6	O	O	O	O	6	O	O	O	O	O	6	24	4
	O	O	O	6	O	O	O	O	6	O	O	O	O	O	6	24	4

FIG. 6A

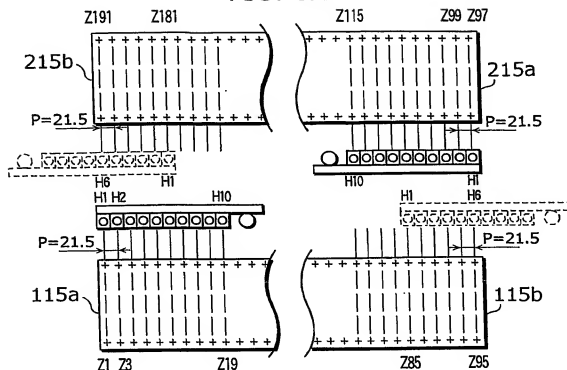


FIG. 6B

10 nozzle heads	Inner side	Z1 Z2	Z3 Z4	Z5 Z6	Z7 Z8	Z9 Z10	Z11 Z12	Z13 Z14	Z15 Z16	Z17 Z18	Z19 ~ Z86	Z87 Z88	Z89 Z90	Z91 Z92	Z93 Z94	Z95 Z96
	Outer side	Z97 Z98	Z99 Z100	Z101 Z102	Z103 Z104	Z105 Z106	Z107 Z108	Z109 Z110	Z111 Z112	Z113 Z114	Z115 ~ Z182	Z183 Z184	Z185 Z186	Z187 Z188	Z189 Z190	Z191 Z192
Heads (Nozzles)	H1	○	○	○	○	○	○	○	○	○	○	—	—	—	—	—
	H2	—	○	○	○	○	○	○	○	○	○	○	—	—	—	—
	H3	—	—	○	○	○	○	○	○	○	○	○	○	—	—	—
	H4	—	—	—	—	○	○	○	○	○	○	○	○	○	—	—
	H5	—	—	—	—	○	○	○	○	○	○	○	○	○	○	—
	H6	—	—	—	—	—	○	○	○	○	○	○	○	○	○	○
	H7	—	—	—	—	—	—	○	○	○	○	○	○	○	○	○
	H8	—	—	—	—	—	—	—	○	○	○	○	○	○	○	○
	H9	—	—	—	—	—	—	—	—	○	○	○	○	○	○	○
	H10	—	—	—	—	—	—	—	—	—	○	○	○	○	○	○

○ : Picking up possible

— : Picking up impossible

FIG. 7A

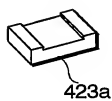


FIG. 7B

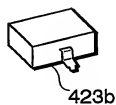


FIG. 7C

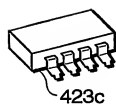


FIG. 7D



FIG. 8

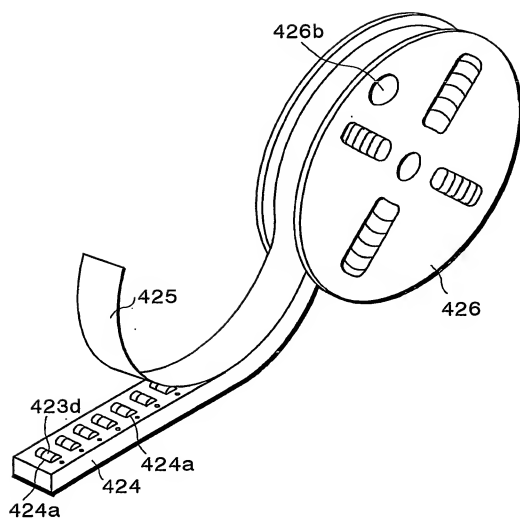
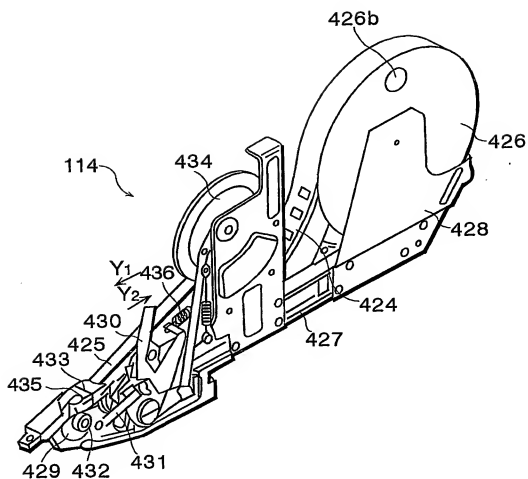


FIG. 9



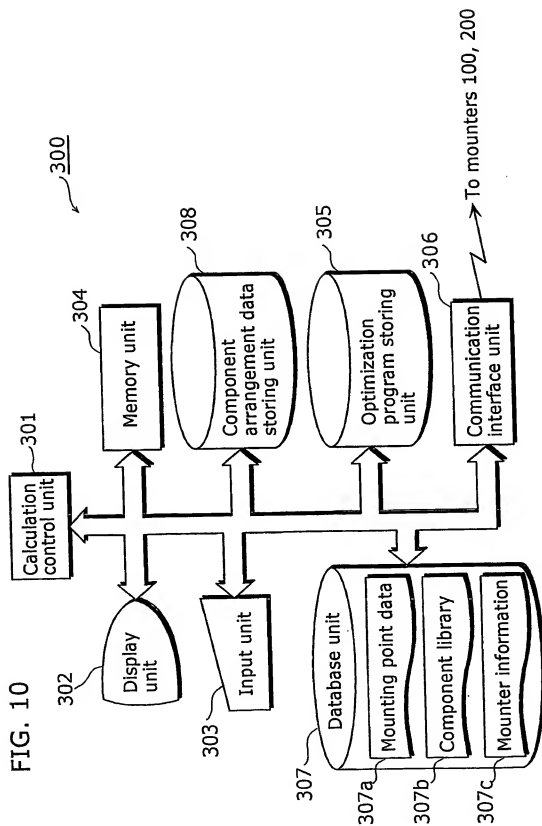


FIG. 11

307a

Mounting points $p_i = (\text{Component type } C_i, \text{ X coordinate } X_i, \text{ Y coordinate } Y_i, \text{ Control data } \phi_i)$

NC data is a list of mounting points p_i

$$\text{NC data} = \begin{pmatrix} p_1 \\ p_2 \\ p_3 \\ \vdots \\ \vdots \\ p_N \end{pmatrix} = \begin{pmatrix} c_1, x_1, y_1, \phi_1 \\ c_2, x_2, y_2, \phi_2 \\ c_3, x_3, y_3, \phi_3 \\ \vdots \\ \vdots \\ c_N, x_N, y_N, \phi_N \end{pmatrix}$$

FIG. 12

307b










Component name	(Appearance)	Component size (mm)			2-D recognition method	Pick-up nozzle	Tact time (sec.)	Speed XY				
		X	Y	L								
0603CR		0.6	0.3	0.25	Reflection	SX	0.086	1				
1005CR		1.0	0.5	0.3-0.5		SA						
1608CR		1.6	0.8	0.4-0.8		S	0.094					
2012CR		2.0	1.25	0.4-0.8								
3216CR		3.2	1.6	0.4-0.8								
4TR		2.8	2.8	1.1		Cylindrical tip	0.11					
6TR		4.3	4.5	1.5								
1TIP		2.0	φ1.0	-								
2TIP		3.6	φ1.4	-								
1CAP		3.8	1.9	1.6		S	0.13		2			
2CAP		4.7	2.6	2.1								
3CAP		6.0	3.2	2.5		M						
4CAP		7.3	4.3	2.8								
SCAP		4.3	4.3	6.0		ML				0.13		
LCAP		6.6	6.6	6.0								
LLCAP		10.3	10.3	10.5								
1VOL		4.5	3.8	1.6-2.4		M				0.13		2
2VOL		3.7	3.0	1.6								
3VOL		4.8	4.0	3.0								

FIG. 13

307c

Unit ID	Head information	Nozzle information	Cassette information	Tray information
110	10 nozzle heads	SX,SA,...	96	8 levels
120	10 nozzle heads	None	96	None
210	4 nozzle heads	S,M,...	48	None

FIG. 14

Component name	Unit ID	Z number
0603CR	110	5
1005CR	120	8
1608CR	210	4
2012CR	120	22

FIG. 15

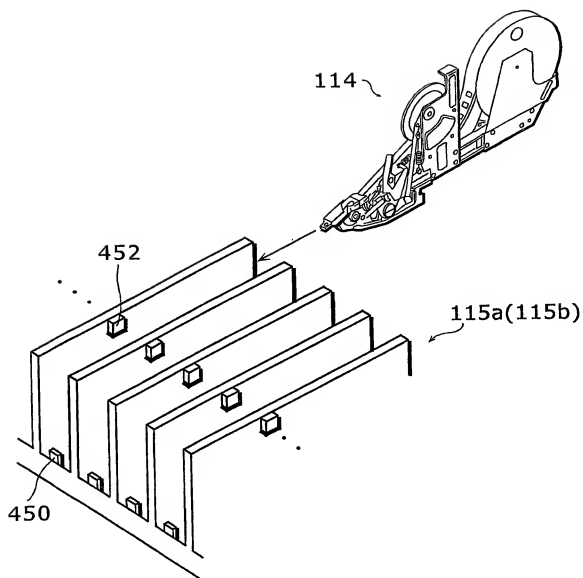


FIG. 16

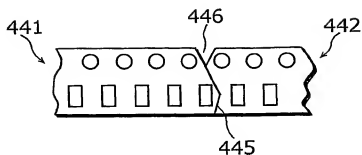
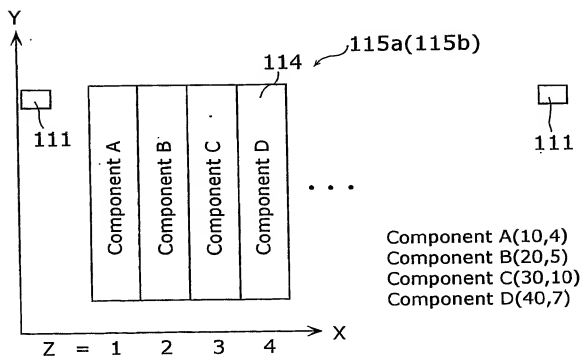


FIG. 17



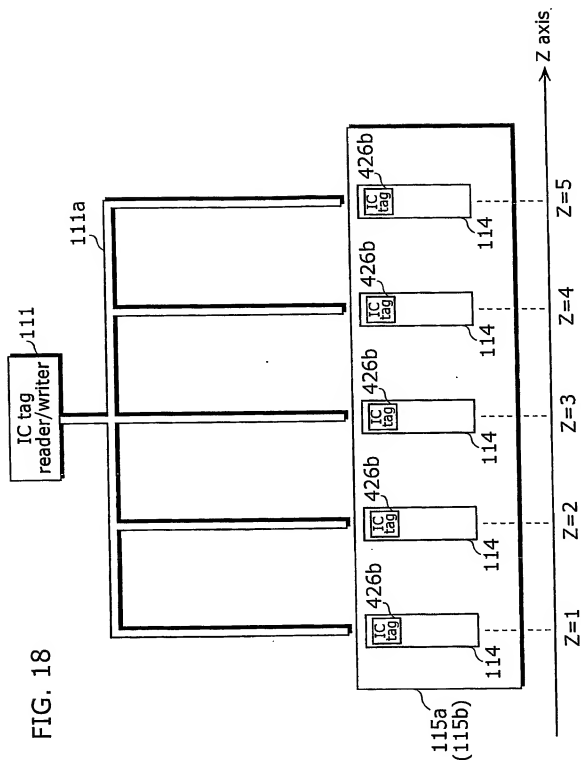


FIG. 19

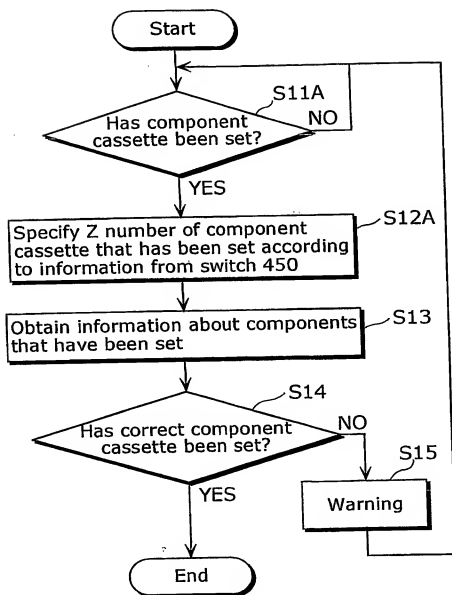


FIG. 20

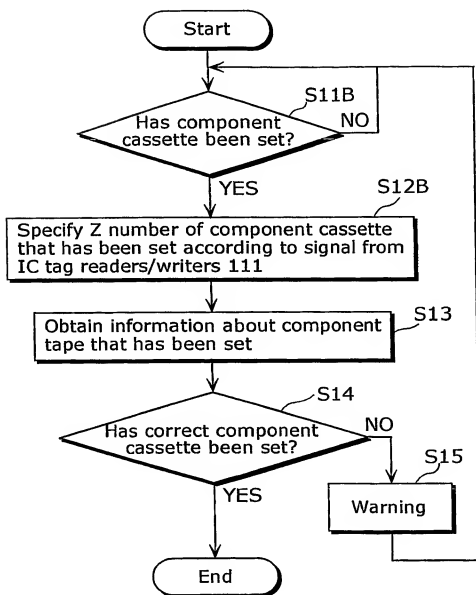


FIG. 21

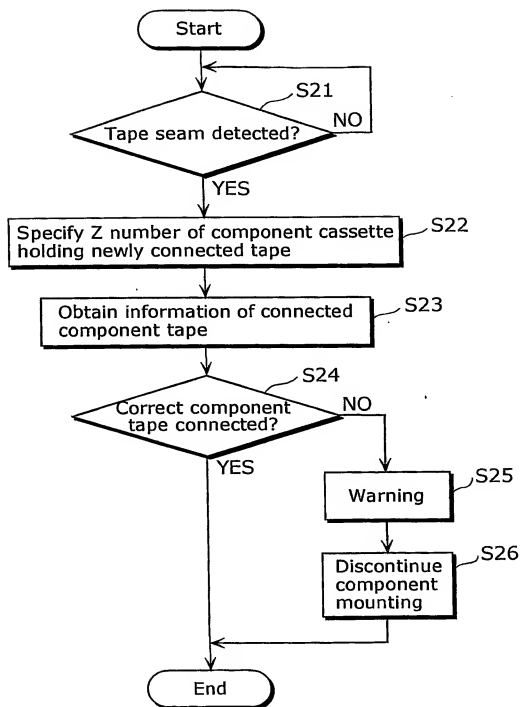


FIG. 22

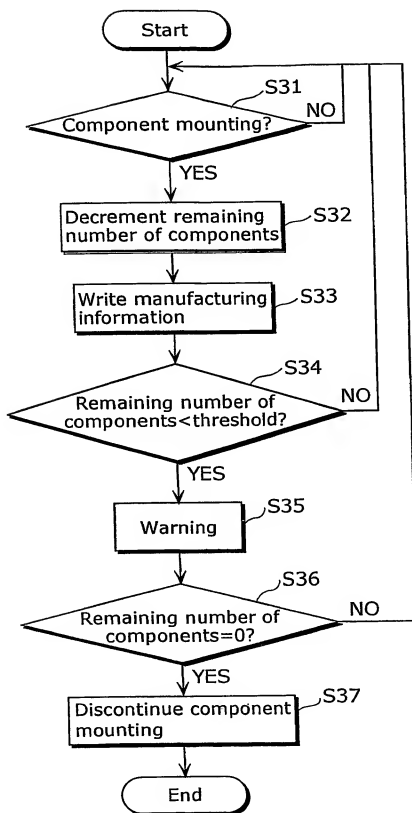


FIG. 23

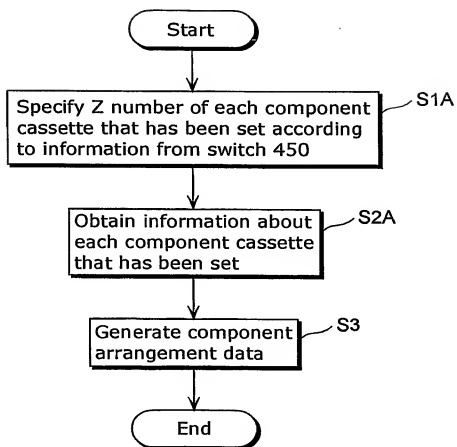


FIG. 24

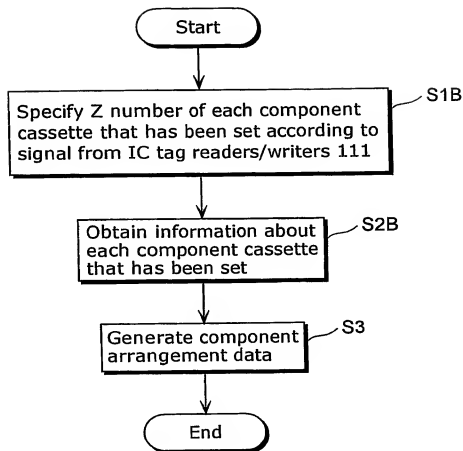


FIG. 25

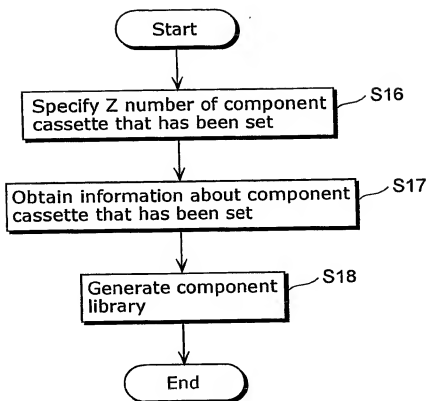
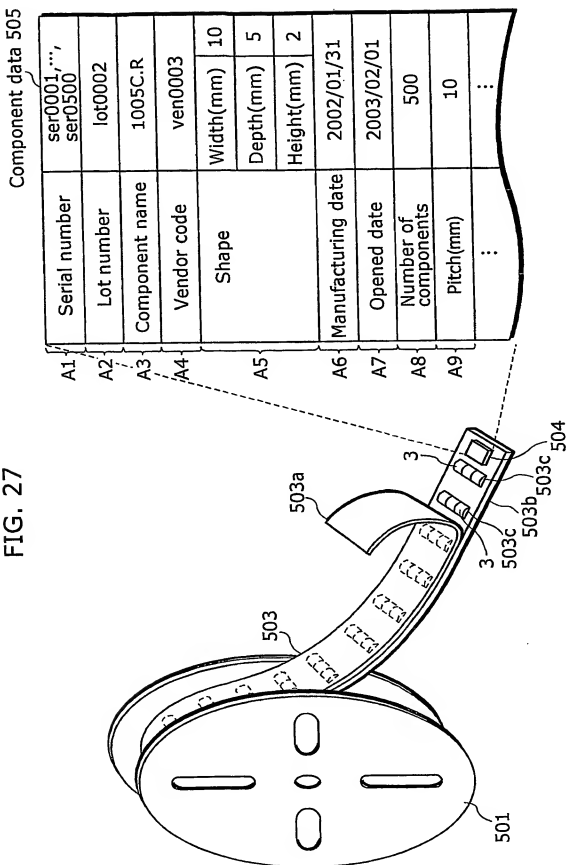


FIG. 27



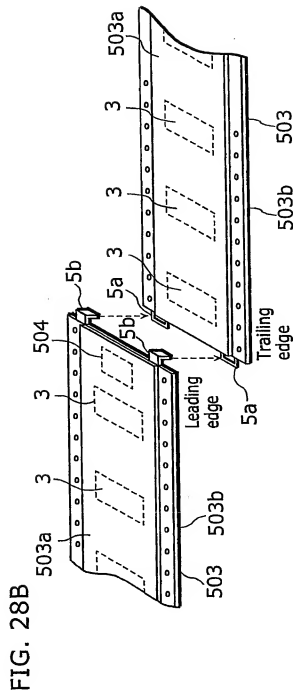
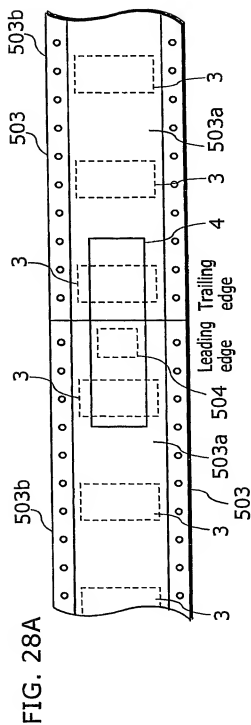


FIG. 29

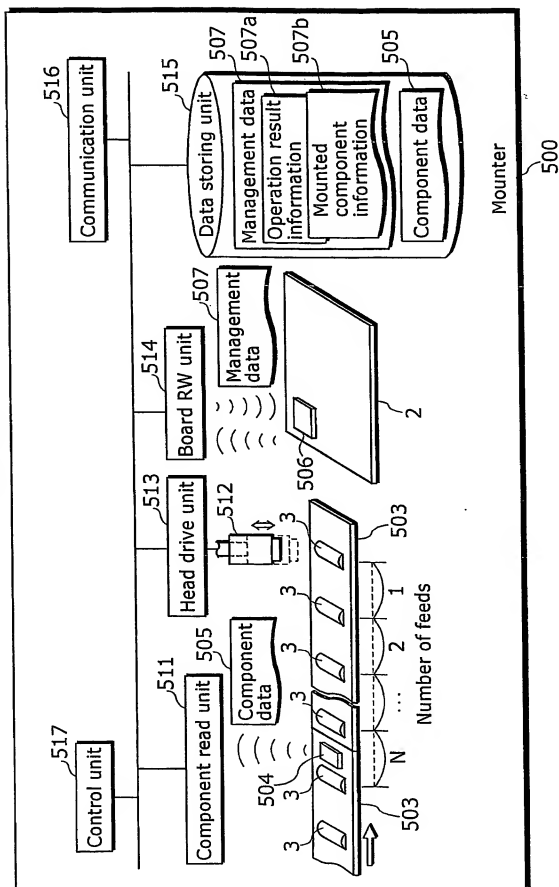


FIG. 30

Board ID:PB01ID/ Lot number:PB01Rt					B3		B4	B5			B6		Operation result information 507a
B1		B2		Date/time of insertion	Tact time	PG	Error			Index			
Machine name							Date/time of occurrence	Code	Step	Idx 01			
CM402		2003/01/06 11 : 16 : 34		35 sec	PTESTA	2003/01/06 11 : 16 : 55	MC0005	100	100			Idx 01	
NM2544		...		...	...	...	...	...	...	...
⋮				

FIG. 31

Mounted component information 507b

Index:Idx03		
Index:Idx02		
Index:Idx01		
C1	C2	C3
Position	Component name	Serial number
X1, Y1	1005C.R	ser0001
X2, Y2	1006C.R	ser0002
X3, Y3	...	...
⋮
		C4
		Lot number
		lot0002
		lot0003
		...
		...
		C5
		Z-axis
		10
		11
		...
		...

FIG. 32

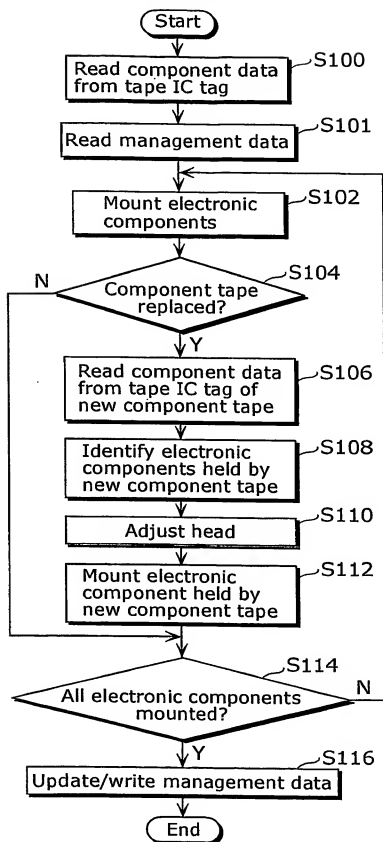


FIG. 33

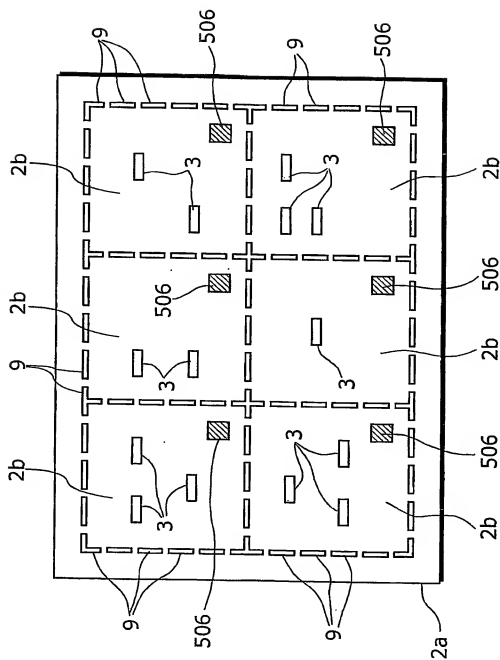


FIG. 34

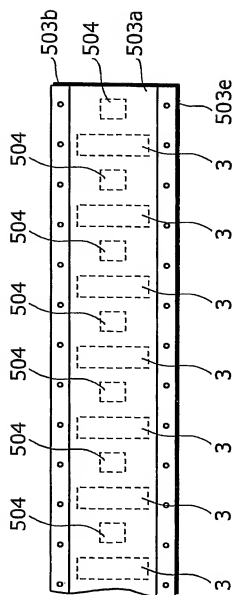


FIG. 35

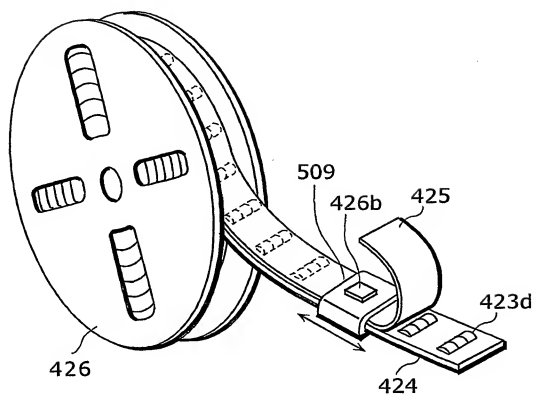


FIG. 36

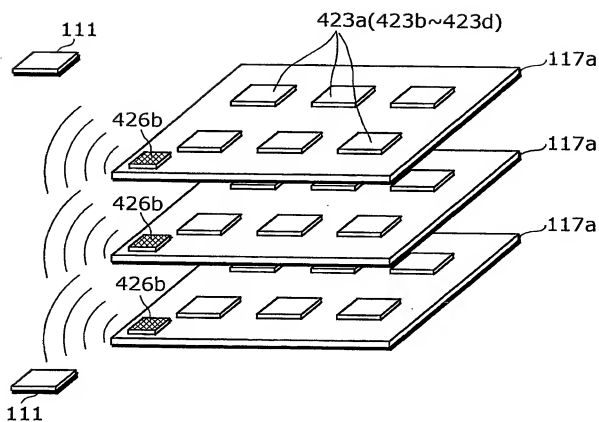


FIG. 37

